Microbial Biology (B): Microbial Associations with Plants

National Program Leader: Ann Lichens-Park
apark@csrees.usda.gov

Historical Program Goals

- To improve resistance to high-impact plant diseases
- Develop novel mechanisms of manipulating plant-associated microbes by interfering with microbial cell-to-cell signaling
- Improved understanding of pathogen spread within a plant

Program Priorities for FY 2008

- Molecular mechanisms of disease or resistance interactions between microbial pathogens and host plants
  - Note: Proposals that focus on plant genes without significant focus on the microbe are not appropriate for this program.
- Molecular mechanisms of microbial communication with other microbes and with non-microbial organisms
- Mechanisms by which plant pathogens and human food safety pathogens spread over short distances

Microbial Biology (B): Microbial Associations with Plants

Things to Note about FY 2008 Program:

- Letters of Intent were required.
- Short distance spread could be studied using plant pathogens and/or food safety pathogens
- If use of model system was proposed, knowledge gained from model systems must be applied to systems of economic importance or importance to sustainable agriculture within the proposed project.

Biology of Plant-Microbe Associations
Program Statistics – FY 2008

- # of Proposals Submitted: 67
- # of Standard Proposals Funded: 15
- % Success: 25% overall; 22% standard proposals
- Average Award Size: $358,666 (not including conferences, equipment, seed, research career enhancement or postdoc)
- Average Award Duration: 33 months for Standard Awards

Microbial Genomics (B): Functional Genomics
National Program Leader: Ann Lichens-Park

apark@csrees.usda.gov

Historical Program Goals

- Increase ability to manipulate microbes for the benefit of U.S. agriculture
- Faster, more accurate and cost-effective detection and diagnosis of plant and animal pathogens
- Improved methods of managing plant and animal pathogens

Program Priorities for FY 2007

Characterization of mechanisms:

- of microbial pathogenicity
- of non-pathogenic interactions between microbes or between microbes and their hosts
- used by microbes to survive or respond to environmental change

Microbial Genomics (B): Functional Genomics

Things to Note about FY 2007 Program:

- Applications must characterize on a large scale genes or networks of genes in a microbe having a **completely or nearly completely sequenced genome**.
- Microbe must be of importance to U.S. agriculture
- Projects are expected to utilize current and emerging **high-throughput technologies**
- Program budget for FY 07 was $5.4 million

Microbial Genomics (B): Functional Genomics

Program Statistics – FY 2007

- # of Proposals Submitted: 43 Standard
- # of Proposals Awarded: 6
- % Success: 14
- Average Standard Award Size: $898,500
- Average Award Duration (months): 38

CSREES/NSF
Microbial Genome Sequencing Program

National Program Leaders: Ann Lichens-Park: apark@csrees.usda.gov
Daniel Jones: djones@csrees.usda.gov

FY 08 Program Goals

- **High-throughput sequencing of the genomes of viruses, bacteria, archea, fungi, oomycetes, protists and agriculturally important nematodes**
- **Development and implementation of strategies, tools and technologies to make currently available genome sequences more valuable to the user community**

FY 08 Program Priorities

Microbes must be:

- **of fundamental biological interest**
- **of national interest (e.g. homeland security)**
- **important to the productivity and sustainability of agriculture and natural resources**
- **important to the safety and quality of the nation's food supply**

NSF/CSREES
Microbial Genome Sequencing Program
Program Statistics – FY 2008

- # of Proposals Submitted: 97 Standard
- # of Proposals Awarded: 7 from CSREES only + 9 from NSF only + 1 funded by CSREES and NSF = 17 total awards
- % Success: 18%
- Average CSREES Award Size: $625,000
- Average CSREES Award Duration (months): 27

Plant Biosecurity Program

Liang-Shiou Lin, llin@csrees.usda.gov

Goals

•Provide the understanding and technologies to mitigate threats to the Nation's agricultural plant production systems

•Provide decision makers and responders the knowledge and tools to cope with high-consequence plant pathogens

•Enable strategies for control and elimination of high-risk plant pathogens

Priorities for FY 2008

1) **Development of rapid detection/diagnostic procedures** that build on genomic sequences as available to facilitate monitoring and mitigation of plant pathogens and arthropods of high consequence and importance. The application must contain a **compelling case for the proposed work relative to plant biosecurity**. See RFA for additional information.

2) **Monitoring and mitigation of diseases caused by high consequence plant pathogens and arthropods** through extension / education programs to implement strategies resulting from, or developed in conjunction with, etiological and epidemiological investigations. The application must contain **a compelling case for the proposed work relative to plant biosecurity**. See RFA for additional information.

Significant Changes (FY 2007 to FY 2008)

1. **Program Scope Broadened**. Based on community input, the program does not identify specific taxa. The PI identifies and supports basis of pathogen / arthropod being of high consequence.
2. **Letter of Intent Required**. See RFA for submission directions.
3. **Parameters of "relative to plant biosecurity" defined in RFA**. Be sure proposal addresses.

Not new, but a reminder:
Only integrated projects are supported that must include research, education, and/or extension objectives (at least 2 of 3).

Funding Statistics: Plant Biosecurity

	FY 2005	FY 2006	FY2007	FY2008
No. of Awards / No. submitted	6 / 30	3 / 12	3 / 10	6 / 20
% success	20	25	30	30
Funding Distribution				
Avg award (FY 2008) = $910,169; nearly all 3 yr duration				